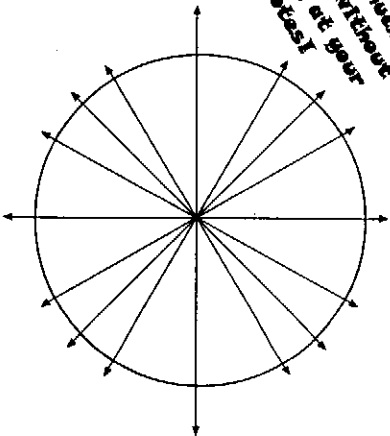


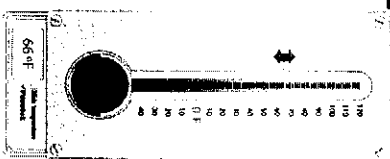
Lesson Objective: Students will be able to make connections between radians and degrees.

Ticket IN:
Fill In as much as
you can without
looking at your
notes!



Lesson Objective: Students will be able to make connections between radians and degrees.

**Convert 66° Fahrenheit
to Celsius.**

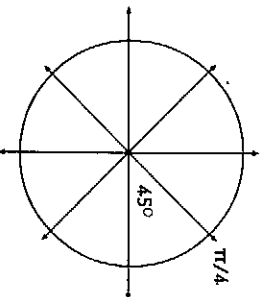


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Lesson Objective: Students will be able to make connections between radians and degrees.

Just like Celsius and Fahrenheit, both RADIANs and DEGREEs describe the measure of an angle.



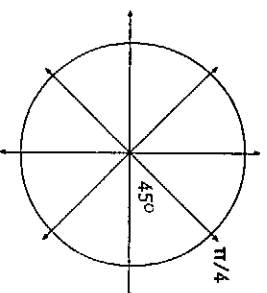
Lesson Objective: Students will be able to make connections between radians and degrees.

What is a radian?

essential question

We are going to look at it in two different ways.

You will need a protractor a compass and some dental floss for this activity!



materials

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Lesson Objective: Students will be able to make connections between radians and degrees.

Okay, so our radians were all approximately

_____°

So what?

Your goal is to convert radians to degrees and degrees to radians.

*radiant
used to
calculator*

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Lesson Objective: Students will be able to make connections between radians and degrees.

Make a connection...

How many degrees are in a circle?

360°

If you go around a circle one time, you have also "traced" the circumference of the circle.

What is the formula for the circumference of a circle?



$C = 2\pi r$ radians

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Lesson Objective: Students will be able to make connections between radians and degrees.

Make a connection...

If the circle is a UNIT CIRCLE, what is the NEW formula for the circumference?

$$C = 2\pi(1) = 2\pi \text{ radians}$$

If completing a full CIRCLE is 360° and completing a UNIT CIRCLE is also 2π radians, then:

$$360^\circ = 2\pi \text{ radians}$$

$$180/\pi = \text{radian}$$

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Lesson Objective: Students will be able to make connections between radians and degrees.

$$360^\circ = 2\pi \text{ radians}$$

$$180/\pi = \text{radian}$$

Using your calculator, what is $180/\pi$?

How close were we with our dental floss?

We can now use $180/\pi$ to convert between radians and degrees.

Conversion factor!

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$$1\pi = 180^\circ$$

Let them try it!

Lesson Objective: Students will be able to make connections between radians and degrees.

Try it!

Convert to degrees:

$$\frac{3\pi}{2} = 270^\circ \text{ degrees}$$

$$-\frac{\pi}{6} = -30^\circ \text{ degrees}$$

$$\cancel{\frac{3\pi}{2}} \cdot \frac{180^\circ}{\pi \text{ radians}} = 270^\circ$$

$$-\frac{\pi}{6} \cdot \frac{180}{\pi} = -30^\circ$$

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Lesson Objective: Students will be able to make connections between radians and degrees.

How would you go the other way?
How would you convert
degrees to radians?

$$360^\circ = 2\pi \text{ radians}$$

$$1^\circ = ? \text{ radians}$$

$$\cancel{360^\circ} \cdot \frac{2\pi \text{ radians}}{360}$$

$$360^\circ = 2\pi \text{ radians}$$

$$360$$

$$1^\circ = \frac{\pi}{180} \text{ radians}$$

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Lesson Objective: Students will be able to make connections between radians and degrees.

Try it!

Convert to radians:

$$60^\circ = \frac{\pi}{3} \text{ radians}$$

$$45^\circ = \text{_____ radians}$$

$$\cancel{60^\circ} \cdot \frac{\pi \text{ radians}}{180^\circ} = \frac{\pi}{3} \text{ radians}$$

$$-45^\circ \cdot \frac{\pi \text{ radians}}{180^\circ} = -\frac{\pi}{4}$$

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Lesson Objective: Students will be able to make connections between radians and degrees.

<http://www.mathlearningtools.com/FlashUnitCircle.html>

Summary:

$$360^\circ = \text{_____ radians}$$

$$180^\circ = \text{_____ radians}$$

$$1^\circ = \text{_____ radian}$$

$$1 \text{ radian} = \text{_____ degrees}$$

interactive
data
change to
radians
when degrees
state problem

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Lesson Objective: Students will be able to make connections between radians and degrees.

Ticket Out:

$$270^\circ = \underline{\hspace{1cm}} \text{ radians}$$

$$135^\circ = \underline{\hspace{1cm}} \text{ radians}$$

$$3\pi/4 = \underline{\hspace{1cm}} \text{ degrees}$$

$$5\pi/6 = \underline{\hspace{1cm}} \text{ degrees}$$

Explain, in complete sentences, what a radian is.

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